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Flowers to Senate: 'Allegations are false'

Article by Bernard Tate
Photos by F.T. Eyre
Headquarters

Lt. Gen. Robert Flowers, Chief of Engineers, refuted charges leveled at the U.S. Army Corps of Engineers, and outlined changes to improve the Corps' study process during testimony before the Senate Environment and Public Works Committee on March 15.

"The Army Corps of Engineers is charged in the press as a rogue agency, out of control, too cozy with Congress, and living by its own rules," Flowers said. "Those allegations are false. The Corps of Engineers has been publicly labeled that it cannot be trusted to do an objective study. The facts do not bear that out. We have been painted as being insensitive to the environment, when in fact 20 percent of our civil works program is dedicated to the environment."

Actual findings

Flowers said he takes "very seriously both the results of the Army Inspector General report on the Upper Mississippi and the report of the National Academy of Sciences," adding that the public needs to be better informed about the study.

Flowers pointed out:

- There were no findings of fraud or waste.
- A 1999 National Academy of Sciences (NAS) report found the Corps' study process fundamentally sound.
- The study had not reached the draft report stage when it was interrupted by allegations, and had not undergone several mandatory reviews.

"The NAS found the model for economic analysis was flawed," Flowers said. "The Academy's report said its shortcomings were so serious the model should not have been used. Dr. Sweeny, the lead Corps economist on the study, developed this model. (*Editor's note - Dr. Don Sweeney made the allegations that began the controversy.*) It was this emerging realization that caused much of the tension between the parties involved.

"Within the Corps, we saw this model was not working," Flowers continued. "The Corps internal processes were in place, and the Corps leadership intervened. That intervention has been characterized as an attempt to manipulate the outcome. I do not believe it was, and the Academy's report confirms the model was flawed.

"The Academy also found that despite the nearly \$25 million we spent on environmental studies, we must do more to integrate this information into the project decision-making process," Flowers said. He told the committee about improving the Corps' planning guidance last April, which clarified the Corps' ability to develop projects for environmental restoration.

"In partnership with the states and other federal agencies, we have made strides in understanding the ecology of the Upper Mississippi and in restoring its environment," Flowers said. "We also pledge to more thoroughly examine non-structural alternatives."

Flowers listed other changes in the Upper Mississippi and Illinois River study process:

- Continuation of the study after assessing the find-



Lt. Gen. Robert Flowers, Chief of Engineers, testified before the Senate Environment and Public Works Committee, refuting charges against the Corps of Engineers and outlining planned changes.

ings in the Inspector General and National Academy of Sciences reports.

- Establishing a Washington-level principals group, including senior people from other key federal agencies. The Corps will lead the study, but this group will provide national-level balance and guidance on important economic and environmental issues.

- Establishing a similar group at the regional level composed of professionals from the Corps, other agencies, the states, industry, and environmental groups.

- Restructuring the study team and placing continuation of the Upper Mississippi and Illinois River Study under direct supervision of the Mississippi Valley Division commander, a one-star general.

"One finding I want to address specifically is that the Corps provided inappropriate access to the barge industry," Flowers said. "Public involvement began early in the study. There were 34 public meetings with more than 2,400 attendees and 2,500 comments. Mailings went to almost 10,000 individuals, agencies, and stakeholders. And there are more meetings to come.

"The users (the barge industry in particular) will pay for half of the construction of any solution, and the improvements will have a great impact on their cost of doing business," Flowers said. "We must provide them access to the study and consider their input. We provided similar access to environmental groups and other stakeholders throughout the study process. We welcome and use the input we receive from all interest groups and individuals."



Alan Smith (left) of Seattle District's Urban Search and Rescue Team, and FEMA geologist Ed Prych inspect earthquake damage at King County Courthouse. (FEMA Photo)

Corps folks ride out earthquake

By Dave Harris
Seattle District

Forty-five seconds of shaking seemed like eternity. Federal Center South in Seattle rattled and rumbled in an Ash Wednesday earthquake with a magnitude of 6.8. Seattle District employees had already talked about a recent seismic study of their historic office building, built by Henry Ford in 1928. Would this be the big one? Thankfully, the riveted steel frame building performed as designed and predicted.

"What an experience," said Steve Cosgrove in the Public Affairs Office. "I'm sitting there, drinking my tea, when the wall started banging. Before I could say 'What the...?', a piece of tile hit me on the head. No damage; it was my head.

"The wall and windows were shaking violently," Cosgrove continued. "The floor started pulsating. I dove under the desk until the shaking subsided (it seemed like forever), thinking to myself, 'Something like this could kill you.' As soon as it stopped, I grabbed my palm-top, checked to see if a coworker was OK (she was already gone), and headed for the door at a quick clip.

"Jeez, that building shook and groaned like a con-

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Insights

Environment in good hands with Corps

By Col. Lowell Moore
Chaplain, U. S. Army Corps of Engineers

I confess — when I came to the U. S. Army Corps of Engineers I had some pre-conceived ideas about engineers. I'm sure you know the stereotypes:

- Very bright, logical, rational, cause-and-effect thinkers, but a little weak when it comes to emotions, sympathy, and affection.

- Loves the hard sciences like math and physics, but have little use for the soft sciences like psychology, sociology, and philosophy.

- If you can't see it, touch it, and measure it, it's probably not real.

- Can split the atom and put it back together, but can't think of a thing to say at a party.

When I joined the Corps I expected to find a lot of people who would see a person fall off a ladder, instantly recall that the acceleration of gravity is 32 feet per second per second, estimate the height of the ladder, and be more interested in the maximum speed during the fall than how the person felt on impact.

Or when discussing the environmental impact on the sturgeon, they would reason that the sturgeon had the Earth for 225 million years and Man has had the Earth for less than two million years. The sturgeon had his turn and didn't do much with the Earth, so now it's Man's turn to change the world into something practical, and useful.

I know there are a lot of non-engineers in the Corps, but I assumed that this organization attract the kind of

people who would share those engineer stereotypes.

Well, if there is any truth to these engineer stereotypes, I haven't found them in the Corps of Engineers. Instead, I have found the Corps to be full of wonderful, sensitive, caring people. This became especially clear as I became aware of the outstanding care the Corps demonstrates when dealing with ecological and environmental issues. Everywhere I go and every briefing I get, I'm amazed at the energy and effort that is given to our environment.

Did you know that:

- Walla Walla District is working on salmon recovery and 20 percent of its operations and maintenance budget goes to fish?

- San Francisco District runs a fish hatchery, and is working to reclaim wetlands in San Francisco Bay?

- Buffalo District is working on ways to improve the water quality of the now-polluted Onondaga Lake, and is working with Canada to change the emphasis of the St. Lawrence Seaway from navigation, commercial, and power to environmental?

- Did you know our labs are finding new and better way to remove contaminants from contaminated soil?

- Vicksburg District is working on ways to control the course and water level of the Mississippi River without harming the wildlife in and along the river?

- The Engineer Research and Development Center has learned to give hearing tests to manatees to help develop ways to keep manatees from getting caught in the locks along the waterways?

And it's happening everywhere, in every district! If I



listed all the environmental concerns of the Corps in the space allotted for my article, I'd have to use print so small you couldn't read it. There are a lot of organizations *talking* about the environment, but I don't know of many that are actually *doing* as much for the environment as our Corps!

I know there are those who read, "Be fruitful and increase in number; fill the earth and subdue it. Rule over the fish of the sea and birds of the air and over every living creature that moves on the ground." (Genesis 1:28), and assume this is a license to ravage and destroy the earth for personal gain. That's not what God meant, and that certainly is not the philosophy of the Corps of Engineers.

April 22 is Earth Day, and all I have to say to the U. S. Army Corps of Engineers is, "Way to go! Keep up the good work! You're doing great!" (And, I'm sure *my* Boss appreciates the way you are taking care of His creation.)

Senate

Continued from page one

Flowers told the committee that one of his goals is to guarantee their confidence in the Corps and its products. He is proposing two sweeping changes:

- Creating an independent review panel for large, complex, or controversial studies. It will be a mixed group of Corps senior leaders and outside independent experts.

- Reinstating the Chief's Environmental Advisory Board this month.

Other allegations

Then Flowers turned to other charges leveled at the Corps.

"Are we a 'rogue agency' outside executive branch control and 'too cozy with Congress?' Absolutely not," Flowers said. "We are a military organization under the civilian leadership of the Assistant Secretary of the Army (Civil Works), and the military supervision of the Chief of Staff of the Army. When I came onboard, I co-signed a letter with the Assistant Secretary that reiterated this relationship and our individual roles and responsibilities.

"I submit that the Corps is subject to higher executive branch and congressional oversight than any other federal activity," Flowers continued. "Our projects are separately authorized in a bill passed by Congress and signed by the president. Every project is reviewed annually by the administration and Congress as part of the appropriations process. Each project is subjected to a



Lt. Gen. Robert Flowers, Chief of Engineers, outlined changes in the Corps planning guidance for the Senate committee.

benefit-cost analysis unique among federal agencies.

"The second charge is that the Corps cannot be trusted to do an objective study and has a bias for construction," Flowers said. "The facts tell a different story. Of every 100 reconnaissance studies, only 16 result in construction. Five of six are weeded out. We examined 15 cases where we projected usage on the inland waterway system, and the majority shows actual traffic was close to or exceeded projections. Only in four cases was traffic significantly below projections.

"Another charge is that our projects benefit a few well-

connected beneficiaries such as large agricultural interests, barge companies, and foreign ship owners," Flowers said. "The facts don't support the charge. In all our major mission areas, the benefits are widespread. For example:

- 98 percent of the nation's international trade comes through Corps-maintained harbor channels, providing jobs for 13 million Americans.

- Since 1959, Corps projects have prevented nearly \$500 billion in flood damages, returning nearly \$6 in benefits for every \$1 invested.

- The Corps hosts 380 million visitors a year at recreation sites.

- We produce 24 percent of the nation's hydropower.

- Your investment in the Corps of Engineers produces a 26 percent annual rate of return, and has put \$30 billion in tax revenues and savings into the U.S. Treasury.

"Finally, we are accused of continuing insensitivity to the environment. This is unfounded," Flowers said. "Again, our environmental program is now 20 percent our civil works program, and is growing. Projects with environmental benefits as the principal output now comprise the largest number of study new starts, more than navigation or flood control.

"During the many years the Corps has worked in our country, society's needs and values have changed, and we have changed, too," Flowers concluded. "We have fully integrated environmental values into every phase of our program."



Letters to the Editor



An affront

Chaplain Col. Moore's recent "Insights" column (*Engineer Update*, February 2001) is an inappropriate use of a taxpayer-funded publication to proselytize. His preaching that "the Great Lover of the world, God, has placed His own personal ad in His book, the Bible" sends a clear message to every employee in the Corps of Engineers that Christianity is the only one true and right religion.

Col. Moore's statements are an affront to Jews, Muslims, Hindus, Buddhists, Wiccans, Humanists, Unitarian Universalists, and virtually every other minority faith tradition (not to mention atheists) represented in the Corps. The very title betrays the belief that our religions do not represent loving faith communities, that those of us who are not Christians are, in effect, "looking for love in all the wrong places."

This is not a "first" for the *Engineer Update*. In March 1999, Chaplain Lt. Col. Carlson extended his "invitation to all of us in the Corps" to find "a loving, eternal Heavenly Father who welcomes all of His children." His August 1999 article ends with a hope that we will all "craft a vision of eternal life," such as, "a hill called Calvary near Jerusalem."

These articles reveal a pattern of the *Engineer Update* espousing one particular faith over all others. You have now assisted two chaplains in blatant attempts to convert the entire Corps to Christianity.

Your appended disclaimer does not relieve you of responsibility for actively distributing religious messages

of a particular faith to a targeted audience at public expense. This clearly violates our constitutional separation of church and state.

Recent initiatives concerning how we "Invest in People" have focused on increasing diversity among our ranks. That includes religious diversity. Not everyone's religious paradigm includes a male god, a savior, or eternal life. Christianity is *not* the only legitimate faith, although our chaplains would, apparently, disagree.

Alan R. Anacheke-Nasemann
Buffalo District

First Amendment violation

I object to the continuing and primarily Christian proselytizing which appears in the "Insights" column in *Engineer Update*. Articles have contained references to the New Testament and Old Testament. Most people in this world follow neither book.

The First Amendment of the U.S. Constitution prohibits the establishment of religion, which means there should be *no* governmental support for religion. Chaplain's work for the military exists to comfort persons desiring such comfort, and who are away from home and known support systems. In that context, support for religion is acceptable. It is *not* acceptable as part of a general Corps informational publication. If I wish to read about a particular religion, I will do so on my own time and money, not the government's.

The column is no different than, and as obnoxious to me as, the uninvited church proselytizer who rings my doorbell, or the phone salesman who calls during dinner. The difference is that I do not support those people with my tax dollars, nor do I receive their information as part of my work. I have no wish to be ambushed by a specific religion in a publication which comes to me because I am an employee in the Corps of Engineers.

My motivation in writing is not publication of my letter. I write to alert you to the negative impact of the sectarian aspects of the "Insights" column. I would like the sectarian aspects eliminated. If the column cannot be written without sectarianism, then it should be discontinued.

B. Kastle Brill
Buffalo District

The "Engineer Update" welcomes all opinions. While I understand your concerns, I do not agree with them.

The "Engineer Update," like all other publications in the Army, is governed by AR 360-1, "The Army Public Affairs Program." This regulation states in 13-1b(4) that a publication may carry opinion pieces as long as they "Distinguish between and clearly identify editorials (command position) and commentaries (personal opinion)." The "Insights" column clearly makes that distinction.

As an Army major command, the Corps of Engineers is authorized a full-time chaplain. Our chaplain's charge is to minister to the spiritual and emotional needs of people throughout the Corps, and "Insights" is one tool to accomplish that mission. In fact, it is probably the chaplain's most effective tool, in terms of reaching sheer numbers.

Our chaplains work very hard to write columns that address spiritual truths and dilemmas common to all people, regardless of their beliefs. Yes, the chaplains sometimes use examples and scriptures from their own faith and traditions. I would expect and support the same if the Corps were assigned a Jewish or Muslim chaplain. (Or Buddhist. I understand the Chaplains Board is considering accrediting Buddhist priests.)

But neither Col. Moore nor Lt. Col. Carlson have ever exhorted anyone to change their beliefs, or held up any belief system as the One True Way. In fact, they have gone out of their way to avoid that. Just because our chaplains are Christian does not invalidate their personal opinions, or preclude them being published in the "Engineer Update," as long as those articles are clearly identified as opinion. **EDITOR**

The "Engineer Update" welcomes letters to the editor. Please write to:

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All letters must be signed. No anonymous letters will be published. The editor also reserves the right to edit letters for length, grammar, and newspaper style.

Earthquake

Continued from page one

stipated elephant," Cosgrove added.

Fortunately, all 600 employees escaped. A stray file cabinet and bookcase toppled, plaster fell, bricks cracked, and ceiling tiles left black holes throughout the block-long General Service Administration (GSA) building where Seattle District is prime tenant.

GSA closed the building initially, but Corps structural engineers examined the building's exterior, the foundation, the roof, expansion joints, pipes, and stairwells to determine if the building was safe to occupy. They were teamed with GSA mechanical engineers and electricians who were familiar with buildings' features and hazards.

By evening they determined the building was safe to reoccupy the following morning. GSA-contracted cleaning crews arrived to work through the night to dust, vacuum, and replace fallen ceiling tiles. Returning workers were astonished at how well the office areas had been returned to pre-earthquake condition.

The district immediately sent representatives to the Federal Emergency Management Agency's (FEMA) Regional Operations Center and the state Emergency Operations Center (EOC) to plan the necessary emergency services support. Seattle District's EOC began 24-hour operations. Special facilities with computers were



Seattle Chocolates was one of the worst hit buildings. (Photo by Shannon Chenoweth, Seattle District)

set up for a multi-Corps-organization task force for one of six FEMA missions. The task force, coordinated by project manager Alan Coburn, was to perform verification and valuation of damage to public buildings in the disaster area, including the King County Courthouse.

"We also responded to the Shoalwater tribe's request for flood control assistance," said Arill Berg, Chief of Emergency Management. "Eric Winters and his team placed a 1,500-foot protective berm along the coast to protect the tribal center and other reservation assets."

"We also offered help to Fort Lewis, and inspected several reserve centers for the 70th Reserve Support Center," Berg added. "We provided four structural engineers to FEMA and our Native American coordinator." In addition, employees inspected facilities at McChord Air

Force Base, south of Tacoma, Wash., near the earthquake's epicenter.

With many Seattleites attempting to make phone calls and cellular towers out of service, few calls got in or out. Dutch Meier, Chief of Public Affairs in Walla Walla District, patched into Seattle workers at home and at projects. Homes became temporary offices enabling a draft news release to go to Meier and his staff. They changed logos to Seattle District and dispatched the news that projects were operating "business as usual." Updates appeared on Seattle District's strategic Web site.

Ernie Gomez, dam safety officer, headed for Mud Mountain and Howard Hanson Dams with teams of experts.

"On-site forces implemented their respective post-earthquake response inspection procedures," Gomez reported.

"Within hours of the event, additional dam safety team inspections were also conducted."

Experts from the Waterways Experiment Station came in to participate.

"The Lake Washington Ship Canal and Mud Mountain Dam did not experience any dam safety related damage," Gomez said. "Howard Hanson Dam experienced fine cracks at the crest, in the right abutment parking area, and on the upstream face access road. The strong motion instrument housing moved about four inches upstream."

Two trenches were excavated on the dam crest to study the cracks. The cracks were shallow and caused by density variations in the underlying soil and rock materials, utility lines, and utility trench.

Gomez concluded that Hanson Dam had behaved as designed, and the project was safe for continued operation.

Seattle District commander Col. Ralph Graves led a town hall meeting at week's end. Structural engineers gave employees a grass-roots perspective, GSA discussed air sampling, and employees offered suggestions for further testing.

Larry Senechal, Chief of the Civilian Personnel Advisory Center, passed out brochures on the Employee Assistance Program offering counseling about earthquake concerns, and emotion support to frazzled workers.

Soldiers in Hawaii get new family housing at Schofield Barracks

Article and Photos
By Michelle Cain
Honolulu District

If the Tuckers are any indication, there are 64 very happy families living in brand-new family housing on Schofield Barracks.

Warrant Officer Two James Tucker of C Co., 1st Battalion, 25th Aviation Regiment, his wife Gayle, daughter Elizabeth, and granddaughter Alaysia moved into their quarters in the newly completed project in November.

"We absolutely love them," raved Gayle Tucker. "The space is unbelievable. There's lots of storage space and a beautiful yard. We couldn't ask for more. We're just so pleased with this house."

The fiscal year 1999 Family Housing New Construction Project is the first designated as officer housing since new construction began in 1990, said Keith Nishioka, the Facilities Maintenance Coordination Officer of the Directorate of Public Works (DPW). Until now, all new construction and revitalization projects have been for enlisted soldiers and non-commissioned officers.

A blessing. "This project is a blessing for the company grade category," Nishioka said.

Honolulu Engineer District (HED) awarded the contract for 64 junior officer units to Texas-based Hunt Building Corporation in March 1999 at a cost of more than \$13,000,000. It was awarded under the 'design/build' construction concept.

"Typically, we used to do the design, then award a contract to the contractor based on that design," said Glen Takishita, HED project manager. "But today's family housing projects are 'design/build,' which is where we award a contract to the contractor and they come up with the design for the project themselves, based on what is proposed."

This process has been used to build Army family housing in Hawaii since Aliamanu Military Reservation was built in the 1970s.

Design/build. The design/build process works well for family housing construction because the units don't need to be built to conform to military standards of construction, as other installation projects do, Takishita explained. Housing can be built to commercial standards, providing a product similar to what's available outside the installation.

The 'design/build' contract is a seamless entity. The



Gayle Tucker appreciates the well-designed kitchen in her new home at Schofield Barracks.

designer is part of the contractor's staff, so if the contractor has a problem with the design during construction, he can fix it without going back to the architect-engineer consultant or in-house designer, explained Lise Ditzel-Ma, the original project manager before taking maternity leave.

Got it down pat. "It's been so successful, and we have it down pat," she said. "We'd like to make all military construction 'design/build.' The liability is less on the government, and it's faster to get problems resolved because the same entity is responsible for it. It's the wave of the future in military construction, and it's more cost-effective for the government."

According to Takishita, giving the design responsibility to the contractor saves the government money upfront. In addition, each family housing project is a learning process.

"We try to make use of lessons learned from previous projects and improve as we go along," Takishita said. "We also work closely with DPW to find out what they want included in each project, and then try to incorporate all of their requests into the Request for Design."

"It's a partnership," Nishioka said. "If there were any problems, the Corps was quick to react to our concerns. Even the contractor took that into account and tried to rectify any problems that evolved during the construction process."

Team effort. HED Construction Representative Al Carvalho, agreed. "It's a team effort between the design contractor, our office, and all Army agencies involved. We turned over the units in just about a year from groundbreaking. We worked around any problems that came up without stopping work; we just kept on going and met our deadlines."

"We have had several projects with Hunt Building Corporation, and they have always been very cooperative in working with the government," Takishita said. "Their contract proposals are always very well done. They give us everything we ask for, yet their price is consistently lower than anyone else's. We have had few, if any, problems. We have partnered really well with them."

Neighborhood. Carvalho explained that Hunt has a team that specializes in Army family housing. "The units are very well-built. The Army is lucky to have somebody like Hunt who knows how to do business building family housing."

Family housing projects encompass more than just the buildings. They are full-blown neighborhood projects whereby the contractor develops the site in full, to include amenities such as playgrounds and bike paths.

"It's a neighborhood concept," Ditzel-Ma said.

Ultimately, a delighted customer is everyone's goal when a project like this one is completed. And if customer satisfaction can be measured by the Tucker family, all parties involved seem to have scored a perfect 10 this time.



Moving trucks were a common sight as families moved into their new homes at Schofield Barracks.



Cleaning up the Environment

Hazardous, toxic, and radiological waste removal

Civil War ordnance still dangerous

By Maj. Ben Bigelow
and Lou Dell'Orco
St. Louis District

The Civil War ended 136 years ago, but its weapons can still kill. Unexploded ordnance (UXO) from that era can be just as dangerous now as the day it was fired or lost. The unexpected discovery of Civil War UXO complicated the clean-up of a site in St. Louis District.

The district has responsibility for clean-up of five sites in Missouri and Illinois under the Formerly Utilized Sites Remedial Action Program (FUSRAP). Like the others, Plant 2 at the St. Louis Downtown site (SLDS) was contaminated with low-level radiological waste left over from the development of atomic weapons in the 1940s and '50s.

No one realized the site also contained Confederate cannon shells.

Three shells were found in September 1999 during a routine open excavation. This began a chain of events that led to a collaborative partnering effort between the property owner, the local government, two civilian contractors, and personnel from multiple U.S. Army Corps of Engineers organizations to remediate more than 10,800 cubic yards of contaminated soil.

Scrap iron. After the discovery of the initial three cannonballs, Corps archivists wanted to figure out how they arrived at a site with limited connection to the Civil War. Apparently, industrial manufacturing in downtown St. Louis dated back to the mid-1800s. Using historical Sanborn Maps which showed buildings from an 1875 survey, the researchers found a foundry and scrap iron yard, part of the Buck's Stove & Range Company which used to occupy the Plant 2 site.

Buck's manufactured cast-iron stoves by melting scrap iron. USACE experts surmise that many Civil War weapons and munitions were decommissioned and sold as scrap iron. The foundry apparently bought the iron to manufacture stoves. The shells were discovered with fuses intact, suggesting that demil procedures (removing powder and fuse before sale) were not practiced before sale. Ultimately, the company buried the unused rounds.

Atomic work. In 1935 Mallinckrodt purchased and demolished the foundry. Their archived company newsletter revealed that they discovered and disposed of hundreds of Civil War cannonballs while building on the site.

In 1941, Mallinckrodt erected build-



Recovered Civil War-era cannonballs and artillery shells. (Photo courtesy of St. Louis District)

ings on the site to support the atomic bomb program. From 1942 to 1957, under contracts with the Manhattan Engineer District/Atomic Energy Commission, plants at the site processed, machined, and recovered uranium. From 1942 through 1945, uranium processing was conducted at three locations.

One location, Plant 2, was the first area remediated. The FUSRAP team consisted of the St. Louis District project team, the property owner, and the Corps' Total Environmental Restoration Contractor, the IT Corporation.

Like most excavations on a century-old manufacturing facility, the project team fought challenges with weather, unknown utilities, and other complexities while making headway in completing the excavation on schedule. The site is now a Mallinckrodt chemical plant whose work could not be interrupted by FUSRAP procedures.

Excavation. The excavation was roughly circular, about 90x60 feet and varying from 10 to 22 feet deep. Most remedial effort in Plant 2 was complete when the initial three cannonballs were discovered. The UXO was identified by a worker in a pile of excavated soil in the southeast corner of the Plant 2 excavation. A district ordnance expert identified these three munitions as a cannonball, a Brooke-type shell, and a Parrott-type shell.

After discovery of the UXO, manufacturing buildings beside the excavation were shut down and evacuated by the owner. Following coordination with Corps personnel, city authorities (bomb,

arson, fire) removed the rounds and disposed of them off-site.

The old cannonballs caused a significant shift in focus to continue the excavation. Concern about protecting the operating plant and its personnel from explosion was primary to both the Corps team and the plant owners. In addition, local authorities were interested in maintaining jurisdiction over UXO operations. One thing all parties agreed on was that they wanted to ensure no additional unexploded munitions would be discovered by accident.

Removal plan. To address the concerns of all parties, experts from the Corps' Center of Expertise on Explosive Ordnance Disposal (EOD) in Huntsville, Ala., were asked to help develop a revised remediation plan that would address UXO removal safely.

Expert archivists from St. Louis District's Ordnance and Technical Services Branch researched area history to determine the probable origin of the ordnance, while experts from Huntsville Center assessed the danger posed by any remaining explosives.

This new plan assessed the remaining areas in the footprint of the former Buck's Stove Company to ensure the radioactive soil could be removed quickly and efficiently, while maintaining a safe working environment for both the Mallinckrodt work force and the Corps project team.

For two months, remediation in the main Plant 2 excavation was halted while the plan was developed. Coordination between the district's Ordnance and Tech-

nical Service Branch, the FUSRAP project team, Mallinckrodt management, and the Huntsville EOD team was intense. Manufacturing operations near the excavation produce more than \$1 million in chemical products daily, so the Mallinckrodt management was extremely sensitive to any possibility of damage to foundations or windows that would stop manufacture.

Safety zone. A slow process was necessary to excavate contaminated soil. The original minimum safety distance ranged from 700 meters (765 yards) to 1,500 meters (1,640 yards). But this was not feasible given the nearby structures and the requirements to run a plant.

Coordination among the Huntsville Center safety office, their remediation contractor (Sudhakar Company, Inc.), the site management, the property owner, and the FUSRAP team, resulted in a new safety zone of 80 meters where no unauthorized personnel could be present during UXO removal.

To maximize the time available to the remediation contractor, and to ensure Mallinckrodt's production line could remain operational, IT and Sudhakar proposed a night operation schedule from 7 p.m. to 5 a.m., coinciding with Mallinckrodt's minimal work force.

With approval to proceed, personnel from Sudhakar deployed to St. Louis to conduct UXO removal and avoidance operations, while IT continued soil removal in Plant 2. A grid system was developed to track the removal.

EOD personnel from the district and Sudhakar checked the soil visually and with a magnetometer in 8-12 inch layers before the soil's removal by IT.

Fifty shells. Each 20x20-foot grid square was evaluated, IT cleared the area, then evaluated for radiological contamination. This symbiotic relationship necessitated a slow, deliberate effort. About 20-40 cubic yards of soil were removed per night (compared to 100-150 cubic yards before discovery of UXO).

Cold weather, snow, and ice further complicated the process. The middle-of-the-night cold required workers to rotate from the excavation to indoors every 20 minutes.

Despite these conditions, the project moved quickly, excavating the rest of the Plant 2 site without incident, and discovering and removing almost 50 Civil War shells of various types and sizes.

(Maj. Ben Bigelow is the Deputy District Engineer of St. Louis District. Lou Dell'Orco was project manager for the Plant 2 cleanup.)

Division has \$200 million program

By Lou Fioto
North Atlantic Division

North Atlantic Division (NAD) encompasses 180,000 square miles and 14 states. It includes some of the oldest cities, and some of the most densely populated industrial areas of the nation. Consequently, it also has one of the greatest concentrations of hazardous, toxic, and radiological waste sites.

NAD has a \$200 million environmental protection and restoration program. Its stateside districts in Concord, Mass.; New York City, Philadelphia, Baltimore, and Norfolk, Va., work through the Environmental Protection Agency's (EPA) Superfund program, the Defense Environmental Restoration Program (DERP), and the Formerly Utilized Sites Remedial Action Program (FUSRAP) to restore the environment.

NAD has the largest Superfund program in the Corps, about 70 percent of all its projects. Its FUSRAP and DERP programs also are large. The DERP program includes noteworthy sites like Spring Valley in Washington, D.C., an upscale residential community built on a former military facility. Baltimore District completed one of the Corps' first Superfund assignments, the Lehigh Electric site in Old Forge, Pa., in 1983. Philadelphia District handled MBT Bridgeport in Southern, N.J., a massive cleanup called the poster child of EPA Superfund sites. It was first on the National Priorities List in 1983 and made the cover of *Time* magazine.

Today NAD continues to serve the nation under all three programs. For complete details, visit our Web site at www.nad.usace.army.mil. From there you can branch off to individual district Web sites.

Here are a few of NAD's noteworthy environmental cleanup efforts.

New York District

Storm King Mountain/Cold Spring Foundry.

Storm King Mountain State Park, nestled between West Point and Cornwall-on-Hudson, N.Y., appears pristine and is a favorite for hikers, but it contains unexploded ordnance. From the mid-1800s to the mid-1900s, West Point cadets used an area near the park for artillery practice. Some shells overshot the target area and landed in the park. This problem was mostly overlooked until a forest fire caused ordnance to detonate in 1999, and the park was closed.

In March 2000, the hazard was addressed under the Formerly Used Defense Sites (FUDS) program, which is part of DERP. New York District developed a time-critical ordnance removal action, which included finding and removing ordnance within 25 feet of the eight miles of trails and roads in the park. Preliminary field work began in mid-June, and by mid-July removal was under way.

Workers investigated 235 items within one foot of the surface, and 23 ordnance items were recovered and destroyed — 16 75mm cannon shells and seven M-1907 fuzes. The work was completed on schedule in mid-October, less than seven months. The total cost was about \$1 million.

In December, a contract for an engineering evaluation/cost analysis was awarded to fully evaluate the nature and extent of the hazard and to determine whether further removal actions are warranted. This evaluation should take about 18 months.

Maywood. The FUSRAP project at the Maywood (N.J.) Chemical Company Superfund site is complex. It is in a highly developed area, and includes 24 active commercial properties slated for cleanup.

Teamwork and partnering is critical, so the project delivery team at Maywood incorporated coordination with external stakeholders into its standard business practices. (The team includes members from Kansas City and Tulsa districts.) Coordination with the New Jersey Department of Transportation (NJDOT) is one example.

NJDOT plans major projects in the Maywood site area, including a noise barrier, bridge replacement, highway



Clean-up work is sometimes conducted in residential communities, like this project in New York District. (Photo courtesy of New York District)

widening, and drainage improvements. These projects will impact areas of known radiological contamination at Maywood. To ensure this work is conducted safely and complies with regulations, the team has established regular two-way communication with NJDOT.

Early meetings let each organization educate the others about their projects and responsibilities, and allowed key players to meet. Later meetings focused on more detailed issues such as project status, schedules, and engineering. People from EPA and the New Jersey Department of Environmental Protection, primary regulators at the Maywood Site, are also regular participants.

The benefits of this approach are clear. As NJDOT's engineering design took shape, it was apparent that significant areas of radiation contaminated soil would be disturbed. The Maywood team determined that the best way to protect the NJDOT workers and public would be to perform cleanups *before* the NJDOT improvements got under way. This also minimized impacts on NJDOT's schedule and on business operations at individual properties.

Consequently, the Maywood team is preparing an Engineering Evaluation/Cost Analysis. If approved, an action memorandum will be prepared. The memo would authorize the interim cleanups at properties impacted by NJDOT work, instead of waiting for a cleanup decision for the entire Maywood site.

The Maywood team's work and successes recently earned it the Corps' Project Delivery Team of the Year award. Lt. Gen. Robert Flowers, Chief of Engineers, formally presented the award to the team at an awards dinner in Seattle.

Philadelphia District

Air Force Plant No. 51. The Former Air Force Plant No. 51 in Greece, N.Y., is another FUDS project. The plant produced B-52 bulkheads, and Talos missiles and related equipment. New York District performed a rapid response cleanup at this site.

In September 1959, the plant was closed, and eventually bought by a private concern. The Corps conducted a limited site investigation at the end of 1999, taking water and soil samples from seven different areas. The results indicated that two areas needed the Corps' immediate attention.

The most critical area of concern (AOC) was AOC-1, a

pond northwest of the main building. This pond collected wastewater from electroplating operations. A variety of contaminants, including vinyl chloride, cadmium, chromium, copper, nickel, zinc, and lead were detected in the pond water and sediments.

The \$1.7 million cleanup involved draining the pond and dredging the contaminated sediments. Vacuum tanker trucks removed the liquid for off-site disposal at a proper facility. The sediments were mixed with cement and loaded into dump trailers for off-site disposal at an authorized landfill.

The project faced several challenges. The pond is near a wetlands and a channel leading to Lake Ontario, and the Monmouth County Water Authority facilities are just 80 feet from the pond. Engineering controls were necessary to prevent off-site migration of contaminants. Water and sediment removal were performed in stages by dividing the pond into individual cells.

The Corps maintained a community air monitoring program following New York Department of Health guidelines throughout the work. The

initial phase of work began last October, and ended in February. The district will now perform a remedial investigation/remedial action.

DuPont Chambers Site. The DuPont Chambers Works site is an active chemical plant in Pennsville and Carneys Point Townships, near Deepwater, N.J. DuPont worked for the Manhattan Engineer District (MED) during World War II, purifying uranium for atomic bombs. All MED activities were transferred to the Atomic Energy Commission (AEC) in 1946. DuPont continued its research for AEC until late 1947.

In 1977, a survey found elevated concentrations of uranium in four DuPont buildings, and they were designated as a FUSRAP site in 1980.

Philadelphia District prepared a time-critical removal action memorandum under the National Contingency Plan and the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, the first approved in our FUSRAP program.

The Corps reviewed three disposal options for the structural steel, and determined the most appropriate would be to volumetrically calculate the uranium in the steel. This was a statistical approach to average the contamination into the entire volume of steel, rather than measure it just at the surface. This showed the amount of contami-



nation to be very low-level, allowing for disposal in a "Subtitle C" hazardous waste facility, rather than a dedicated radiological facility.

New England District

In 1999 the National Guard hired New England District for several environmental cleanup initiatives at the Massachusetts Military Reservation (MMR) on Cape Cod. The initiatives include building a replacement drinking water supply system, disposing of unexploded ordnance (UXO), and an impact area groundwater study.

Drinking water supply system. In August 1999, DoD, through the Joint Program Office at MMR, asked the district to provide a three-million-gallon-per-day replacement water supply to the base and surrounding communities.

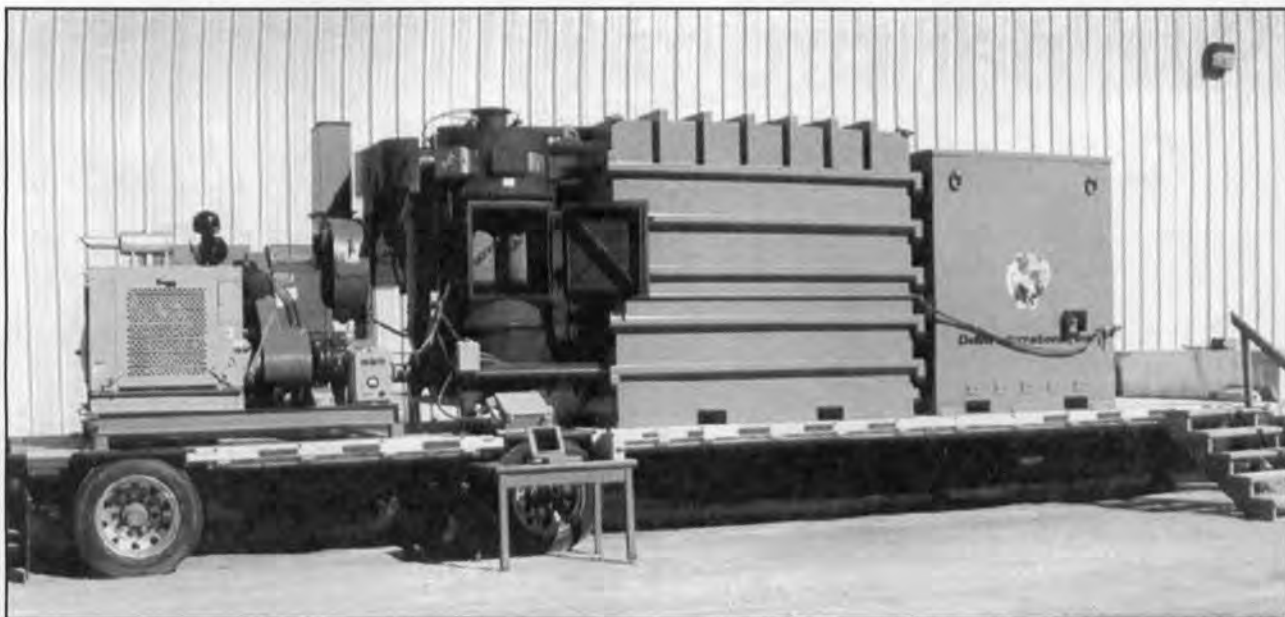
The project has four interrelated activities — water source development, environmental documentation, design, and construction. The project team is required to find the correct quantity of environmentally-safe water in accordance with the Massachusetts Department of Environmental Protection (MDEP) requirements, then design and build a distribution system to provide the water.

Water source well pumping tests were completed in July, and reports were sent to MDEP in September. An environmental assessment for the project was completed in August, and work on the final design is complete. Construction began in September and is expected to be completed by July.

Disposal of UXO. New England District, through the Huntsville Engineering and Support Center, contracted Sudhakar Company, Inc., to use a Donovan T-10 Blast Chamber to safely dispose of UXO. The ordnance is being discovered during an environmental study of the MMR's impact area.

The T-10 Donovan Blast Chamber was developed by DeMil International. The unit includes three principal components — the detonation chamber, an expansion tank where detonation gases are vented for cooling and pressure reduction, and the air pollution control unit which filters detonation gases before discharge into the atmosphere. The trailer-mounted unit is self-sufficient, with its own generator and compressor.

The chamber operators, supervised by experienced



The Donovan T-10 blast chamber has disposed of more than 2,000 pieces of munitions. (Photo courtesy of DeMil International)

UXO personnel, wrap each shell in an explosive blanket and place it in the chamber. Once the chamber is sealed, the blanket is detonated. During explosion, the sound is similar to slamming a heavy door.

More than 2,000 items have been destroyed.

Impact Area Groundwater Study. The National Guard Bureau is using New England District as the supervisory contractor for the Impact Area Groundwater Study. The study is being conducted in accordance with EPA administrative orders under the Safe Drinking Water Act. The transition to supervisory contractor was complete last January. The six-to-10 year project will cost about \$250 million, and involves completed groundwater and UXO studies, followed by cleanup project implementation.

The district will share the results of the study with the Army and DoD to aid others with similar projects.

Baltimore District

Compared to Baltimore District's \$700-million-plus budget, the \$14 million spent on DERP-FUDS work

seems like a drop in the bucket. Compared to the \$12 billion for all FUDS projects, it's a drop in a lake.

But that drop accomplishes good things. Ongoing work to remove chemical ordnance materiel and contaminated soil from a former World War I experiment station in the Spring Valley neighborhood of Washington, D.C., was the only fully funded project at the beginning of fiscal year 2000 (FY00).

As the year progressed, several projects gained \$2.6 million under the Pennsylvania Cooperative Multi-Site Agreement. The larger ones are the former defense properties at Claysburg Air Force Station, Frankford Arsenal, Valley Forge General Hospital, New Cumberland Army Depot, and Keystone Ordnance Works.

In the last days of the fiscal year, the district's FUDS team found money for two projects at the former Nike missile site near Tolchester, Md. The district awarded a contract to remove underground storage tanks that concerned Kent County and the Maryland Department of the Environment. Another contract was awarded to monitor low-level groundwater contamination.

For FY01, the district received \$10 million to continue work at Spring Valley, and \$2 million for properties under the Pennsylvania agreement.

In all, the district's FUDS program has 355 properties. Of those, 290 properties are either ineligible for FUDS cleanup or need no further action. The remaining 65 have work planned or currently under way. Each has from one to five projects, such as site investigations, tank removals, ordnance removals, and water or soil cleanup.

The district's FUDS program includes project managers, budget analysts, engineers, chemists, biologists, industrial hygienists, geologists, and other professionals who serve on project design. The district's area and resident offices execute construction activities.

There's still a lot to do.

"We could use another \$2.4 million this fiscal year for unfunded requirements to meet our remaining high priority projects," said Jack Butler, the program manager. Those include Tolchester and Spring Valley, financing ordnance removal at Tobyhanna State Park, Pa., and other smaller projects.

(Ann Marie Harvie of New England District's Public Affairs Office wrote the section about the Massachusetts Military Reservation. Mary Beth Thompson of Baltimore District's Public Affairs Office wrote the section about Baltimore District. Allen Roos, project manager for the Maywood site, wrote the Maywood piece. David Brouwer and Luz Spann-LaBato also contributed to the article.)



A contractor removes an underground storage tank at the former Nike missile site near Tolchester, Md. (Photo courtesy of Baltimore District)



Nuclear program

Corps has responsibility for three old atomic reactors

By Richard Wright
Headquarters

Most people are not aware that the U.S. Army Corps of Engineers holds permits for three nuclear reactors.

In the late 1950s and early '60s, the Army was at the forefront of nuclear power research and testing. At that time, nuclear power research was performed like most defense research programs—in a secure environment. The research investigated a power source for use in remote areas where oil or coal could not be easily shipped in, or where a mobile power source with a high output was required.

Since the early 1950s, the Corps helped develop, design, and test nuclear reactors. Today, the Corps conducts decommissioning studies and procedures for the Army nuclear power reactor program.

The Corps holds permits issued by the Army Reactor Office for three nuclear reactors. These reactors have been deactivated—the nuclear fuel removed and radiological contamination minimized and contained. The three reactors are in the early stages of decommissioning studies, which will eventually lead to permanent closure and removal. This includes ensuring the protection of human health and the environment near the facilities.

History

In 1953, the Corps issued a report titled *Army Nuclear Power* that indicated electric power production capabilities were needed at remote installations. Research performed by the Corps indicated that nuclear power plants were technically feasible, and that they could prove economically sound for future power requirements. The Chief of Engineers forwarded the report to the Military Liaison Committee, which concurred and forwarded it to the Atomic Energy Commission. Shortly after, the Secretary of the Army agreed with the Corps' objectives and directed the Army to explore the applica-



The *Sturgis* was a surplus World War II Liberty Ship converted to house an atomic power plant. It is shown here during operational testing and training at Fort Belvoir, Va., in 1967. (Corps historical photo)

tion of atomic energy to military requirements.

The Department of Army was (and still is) authorized to build and operate nuclear reactors under Paragraph 91 (b) of the Atomic Energy Act of 1954. The Army began developing small nuclear power plants to produce electrical power in 1954. Research and development involved pressurized water, boiling water, and both liquid metal and gas coolant. The research aimed to design nuclear power plants that could be transported by air, erected quickly, and operated under adverse environmental conditions.

Several reactor prototypes were designed, built, and operated by the Corps. These included stationary facilities, as well as small and large mobile power plants. They were built and operated at Army,

Navy, Air Force, and national laboratory facilities.

None are currently operating. The last power reactor operation took place in 1977 aboard the floating nuclear power plant *Sturgis* that operated in the Panama Canal Zone. Maintenance issues and costs, fuel/core replacement, and military funding at the time marked the end of the Army nuclear power program.

Three reactors

The Corps has responsibility for three of the deactivated nuclear reactors. These reactors include the stationary pressurized water reactor SM-1 at Fort Belvoir, Va.; a sister design, the SM-1A, at Fort Greely, Alaska; and the *Sturgis*, now moored at the Maritime Administration's James River Reserve Fleet facility, near Fort Eustis, Va.

The SM-1 at Fort Belvoir was built in 1957 and used to train nuclear power plant operators. The SM-1 was a single-loop

10-megawatt thermal reactor. It could generate more than 1,700 kilowatts of electrical power (enough power for a small community) and was the first nuclear power reactor to provide electricity to a commercial power grid in the U.S. Hundreds of personnel were trained in nuclear reactor operations at the SM-1.

In 1972 the Chief of Engineers announced that the SM-1 would be deactivated. In early March of 1973 the crew of the SM-1 completed the reactor's final shutdown.

The SM-1A at Fort Greely began operation in 1962. It was a field application of the SM-1, built to evaluate the use of nuclear power reactors under adverse weather and geographic conditions. The SM-1A is a 20-megawatt reactor capable of producing more than 1,600 kilowatts of power, plus steam for base heating and laundry services. The SM-1A operated from 1962 to 1973.

The third Corps deactivated nuclear reactor is the mobile reactor, MH-1A, mounted inside the *Sturgis*, a converted World War II Liberty Ship. The reactor



This is the top of the SM-1's pressure vessel, seen from the roof of the old facility at Fort Belvoir, Va. The SM-1 was the first atomic power plant to feed electricity into a commercial power grid. (Corps historical photo)



The SM-1A at Fort Greely, Alaska, began operation in 1962 to test nuclear power plants under adverse conditions. The plant operated until 1973. (Corps historical photo)

Continued on next page

Team approach handles radiation safety

By Richard Wright
Headquarters

During the past four years, the U.S. Army Corps of Engineers' radioactive site investigation and remediation workload has greatly increased with the addition of the Formerly Used Sites Remedial Action Program (FUSRAP). The 21 new FUSRAP sites added to the Corps' existing radioactive work in other programs, such as the Formerly Used Defense Sites, EPA Superfund, Army Reactor Program, Base Realignment and Closure, Army and Air Force Installation Restoration Programs, and the Support for Other Agencies program.

The Corps also has a large radiation safety program supporting our use of radioactive materials, such as moisture density gauges and laboratory radionuclides at our districts and laboratories. Additional support is provided to operational facilities in radon testing and mitigation.

The increased workload led to a critical need for Corps health physics (radiation safety) support at the project level. Health physicists are professionals who are concerned with the interaction of radiation with the human body, as well as with the environmental and public health aspects of radiological contamination and exposure.

Their job is to ensure that occupational and public exposures to radiation are kept low and that environmental contamination is reduced to safe levels in all circumstances of the work being performed.

In 1997, the Corps had two health physicists, both at the Hazardous, Toxic and Radioactive Waste Center of Expertise in Omaha District (HTRW-CX). The Corps also had two health physics interns at the time who had just completed their initial training program — one each in



A member of the Radiation Safety Support Team tests a railroad tie for radiation. (Photo courtesy of the Safety and Occupational Health Office)

Baltimore and Tulsa districts.

As workload increased, it became apparent that four health physicists could not support the entire Corps radioactive site workload, plus support command radiation safety programs. It was evident that a Corps-wide sharing of technical resources was needed to assist in managing radiation safety across the Corps. The Headquarters Safety and Occupational Health Office, with the Headquarters Environ-



mental Division and HTRW-CX, decided a team approach would most efficiently provide radiation safety resources Corps-wide.

The Corps Chief of Staff formally established the Radiation Safety Support Team (RSST) in December 1997 to provide technical, regulatory, and on-site field support to Corps commands in all phases of radioactive waste environmental restoration projects, and to assist local safety and occupational health man-

agers in their command radiation safety program.

The team has grown as workload increased and the value of in-house health physicists became apparent. The RSST currently has two health physicists in Baltimore District, six in Buffalo District, one each in St. Louis and Tulsa districts, and three at the HTRW-CX.

The RSST is involved with radiation surveys and site investigation, radioactive waste transportation and disposal, radiation risk/dose modeling, nuclear reactor decommissioning, radiation protection training and regulatory assistance, and Nuclear Regulatory Commission license reviews.

RSST members assist project and program managers in determining appropriate radiological clean-up levels by using site-specific data and pathway analysis to assess the risk/dose to an individual or critical groups. The RSST also has extensive experience in profiling, packaging, and transporting radioactive waste for disposal at various facilities.

The RSST, through the HTRW-CX, coordinates the Corps' radioactive waste disposal actions, and provides the link with DoD agencies as required by regulation.

The RSST has worked well through teamwork and the efficiency of sharing technical resources between the commands that execute Corps missions. Communication between the team members has been vital to ensuring that the team provides the best possible technical support. The RSST members confer regularly by conference call and meet annually to share lessons learned.

For radiation safety assistance, contact Julie Peterson, the RSST Coordinator at HTRW-CX, (402) 697-2592; or me, Richard Wright, the Headquarters Radiation Safety Staff Officer, (202) 761-8565.

Nuclear

Continued from previous page

was built in 1966 and went critical in early 1967. The *Sturgis*, a 45-megawatt power plant, was first harbored at Fort Belvoir for operational testing and training. It was then towed to the Panama Canal Zone where it generated electrical power from 1968 through 1976. The MH-1 was shut down in 1976 and towed to the James River Fleet.

Current status and activities

All three reactors are currently in safe-store condition. Essentially this means that after final shutdown, the nuclear fuel and control rods were removed from each reactor and returned to the Department of Energy for disposition. Other structural materials that were radiologically contaminated, and minor primary reactor system components, were cut up, placed in the reactor vessel, which was filled with gravel or concrete and sealed.

Initially, it was decided that safe-store condition would be the safest and most cost-efficient mechanism to maintain the reactors until radiation in the entombed reactor vessels decayed to low levels, when final decommissioning could occur

safely, which could take about 50 years.

Since deactivation, ensuring the safety of facility staff, the public, and the environment is the Corps' primary responsibility. The Corps' Environmental Division was issued Nuclear Reactor Possession Permits by the Army Reactor Office, part of the U.S. Army Nuclear and Chemical Agency (USANCA). These permits detail what requirements must be met to protect workers, the general public, and the environment.

A Radiation Protection Program (RPP) at each facility details safe procedures for working in or near the reactor facilities. The RPP outlines activities necessary to comply with the permits, and to ensure the radiation dose from each facility to workers and the public is as low as reasonably achievable.

A radiation safety officer on the staff of the Corps' Humphreys Engineering Center Support Activity is responsible for ensuring implementation of the RPP at each facility.

The Hazardous, Toxic, and Radioactive Waste Center of Expertise at Omaha District provides technical nuclear, health, safety, and environmental support to the Corps' reactor program. The radiation

protection staff officer at Corps Headquarters provides command radiation safety oversight of the program.

A close working relationship between Corps' staff, the Army Reactor Office, and the installation Department of Public Works' staff ensures that appropriate protection of the public health and safety is maintained.

Earlier decommissioning?

A 1998 USANCA study indicated that maintaining the three deactivated reactors in a safe-store condition may not be the most cost-effective strategy due to escalating decommissioning costs, personnel/maintenance costs, waste disposal options, and so on.

Increasingly strict regulations concerning low-level radioactive waste disposal also plays a role in planning final decommissioning.

Baltimore District is performing an "All-Hazards Survey" of the *Sturgis* to identify the hazards (radiation, lead-based paint, asbestos, etc.) and quantity of hazardous materials present. This data will be used to develop accurate cost estimates for final decommissioning of the reactor

and barge.

The decommissioning could be performed much earlier than initially proposed under the safe-store model. Similar surveys are proposed for the two other reactors.

Environmental protection is a major concern of the Corps in both caretaking the plants and the final decommissioning. Alaska District and U.S. Army-Alaska are in the last phases of a clean-up operation at Fort Greely for the SM-1A.

Low-level contamination of soils around a waste discharge pipeline was detected during a recent base closure and realignment action. The contaminated soil has been removed and is awaiting transport to a disposal facility.

Low-level contamination around the SM-1 at Fort Belvoir also has been removed and disposed of at a licensed disposal facility.

The *Sturgis* is routinely structurally evaluated and maintained to ensure the environment is fully protected from any contamination.

(Richard Wright is the radiation protection staff officer in the Safety and Occupational Health Office in Corps Headquarters.)

Defunct Pennsylvania steel mill is now community industry center

By Hank Edwardo
and Dave Carlson
Pittsburgh District

Duquesne, Pa., overlooks the Monongahela (Mon) River and 270 acres of abandoned property that was once the U.S. Steel Duquesne Works. It is also within sight of Pittsburgh District's Braddock Dam construction project. The former steel plant was in operation from 1890s to the 1980s, and throughout its history produced much of the military's plate steel to support war efforts. The plant later became a finishing mill for U.S. Steels Mon Valley Operation.

As steel markets weakened in the 1970s and foreign competition intensified in the 1980s, the massive facility eventually closed. In 1987, U.S. Steel transferred ownership of the grounds and facilities to the Allegheny County Industrial Development Authority, who looked for potential buyers, and investigated options for the site's future use.

Abandoned. The residents of Duquesne watched as the large mill buildings and blast furnaces where they and their fathers and grandfathers had worked rusted away or were dismantled and sold for scrap. What used to be the economic cornerstone of the Mon Valley was now an abandoned hulk with unknown environmental risks and a bleak future.

The far-reaching implications of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) diminished their hopes that any company would accept the risk of buying and rehabilitating the former steel-making facility.

The site was purchased from Allegheny County in 1990 by a 501(c)3 development corporation called the Regional Industrial Development Corporation (RIDC) of Southwestern Pennsylvania. Their charter is to assist distressed communities by developing abandoned lands and buildings to achieve economic growth. Their purchase agreement included negotiated clean-up cost credits and property tax credits with the former owners.

The RIDC immediately undertook an extensive environmental site assessment (ESA) to determine what types of contaminants and by-products of steel-making had been left behind during the past 100 years.

The RIDC conducted numerous groundwater stud-

ies; hazardous, toxic, and radioactive waste assessments; and Phase II ESA intrusive soils sampling, testing, and analysis programs during the next five years. By 1996 they concluded that most on-site contaminants were within non-residential standards, and that no extensive clean-up actions were required.

Brownfield. In anticipation of approval of the pending brownfields legislation, and as a result of the environmental assessment findings, EPA Region III agreed to transfer regulatory oversight of the Duquesne facility to the Pennsylvania Department of Environmental Protection (PADEP). (Brownfields are lightly contaminated former industrial sites that can be returned to use after cleanup.)

A draft consent order and agreement between PADEP and RIDC defined the cleanup standards and pledged an indemnification of future liability if the cleanup actions were properly executed. RIDC was responsible for site remediation as required by PADEP, and could do so with funding assistance at the state level under the programs of two governors, both who believed that brownfield sites should be made productive again with new industry and business.

In general, cleaning up the old steel mill required recycling or reuse of the existing structures, removal of any high-level contaminants found during

site investigations and demolition of the abandoned structures, protective restrictions on all future site development related to environmental hazards, and placing at least 12 inches of suitable earth fill over the entire site to limit human exposure to any low-level contaminants in the surface soils.

Dredged material. Fortunately, Pittsburgh District could provide 400,000 cubic yards of dredge material from the Braddock Dam construction project to help in the site restoration. The district had a strong interest in the cost savings that could be realized compared to using the approved disposal site more than 20 river miles upstream. RIDC had an equally strong interest in obtaining this material for their site remediation requirements.

Because the Corps' sediment characterization at the Braddock Dam site indicated the dredge materials were

within the state contamination limits for residential and non-residential application, RIDC and PADEP proposed a modification to the draft consent order indicating that Corps of Engineers river dredgings were satisfactory for use as the fill materials.

After extensive negotiations and coordination between Corps Headquarters and RIDC, an indemnification agreement was approved and executed by RIDC and the Assistant Secretary of the Army (Civil Works) in 1998. The agreement defined the responsibilities of each party, and their intent to hold the federal government harmless from potential future liabilities under CERCLA if the dredge materials were used in the remediation plan.

Partnership. The partnership forged between RIDC, PADEP, and Pittsburgh District created a mutually beneficial situation. The government saved about \$4 million by using this site. RIDC gained a sufficient quantity of earthfill materials to comply with its state-directed cleanup action. PADEP had orchestrated another successful brownfield remediation, and removed another former industrial site from their list of priority cleanup sites.

Building the Braddock Dam began in July 1999, and more than 400,000 cubic yards of river sediments will ultimately be placed on the site before the dam is complete. The expansive tracts of available vacant land, and the close proximity of the steel mill to the Braddock Dam site, provided an ideal location for the Braddock Dam Resident Engineers Construction Field office, and the dam contractors offices and equipment yard. The dock front and ramp used to off-load the dredge materials also serves as the contractor's river access point, and a temporary staging areas for building Braddock Dam.

RIDC was responsible for obtaining all environmental permits before beginning the work, and placement areas were coordinated with RIDC to assure maximum flexibility for the contractor. The dredged materials were placed in pre-determined areas, rough graded, and seeded with a mixture of drought-resistant grasses, creating large green spaces.

To fulfill its master plan, RIDC installed roadway infrastructure, sidewalks, landscaping buffers, and utilities that subdivide these large areas into developable land parcels. The site has been renamed the RIDC River Place - City Center of Duquesne, and recently added a mix of new tenants including the Western Pennsylvania Food Bank, and a mix of light industrial, specialty, and high-tech industries.



An old steel mill with contaminated soil (left) is now home to light, specialty, and high tech industries. (Photos courtesy of Pittsburgh District)



Workers place plastic sheeting on Saipan to contain PCB-contaminated soil.

PCBs cleaned up in Saipan

Article by Doug Makitten
Photo by Frank Ono
Honolulu District

Honolulu Engineer District's cleanup project in Tanapag Village on the island of Saipan in the Pacific Ocean has reached an important milestone. More than 20,000 cubic yards of soil contaminated by polychlorinated biphenyls (PCBs) have been excavated and stockpiled. The work began last August and was completed at the end of March. This is the latest accomplishment in a story that dates back to the 1960s.

Honolulu District is overseeing the project in the remote Commonwealth of the Northern Mariana Islands (CNMI), a U.S. Territory more than 3,700 miles west of Hawaii, as part of the Department of Defense's Formerly Used Defense Sites program. The contamination resulted when PCB fluid leaked from capacitors that apparently were once used at the Army's Kwajalein Atoll military installation in the 1960s. As yet, the district has been unable to determine how the capacitors reached Saipan and how they were moved to various sites in Tanapag Village.

The CNMI Department of Environmental Quality reported the capacitors to the Environmental Protection Agency in 1988. The EPA asked the Army if it could use DoD funds to remove the PCBs from the soil and the Army agreed. Honolulu District began the Tanapag soil cleanup in 1991, and the just-completed work is the third phase of project.

Since the beginning, the district has coordinated all cleanup efforts with CNMI and EPA officials, and kept local villagers informed as well.

The third phase of the project was done with EPA oversight under an EPA administrative order issued under Section 7003 of the Resource Conservation and Recovery Act. Environmental Chemical Corporation of Aiea, Hawaii, did the excavation and stockpiling work under contract with the Corps.

Honolulu District is preparing a focused feasibility study of the alternative methods and costs of treating the excavated and stockpiled contaminated soil. When complete, the resulting report will go through public review and comment period. Then the district will consider all substantive comments and prepare an action memorandum describing the method it will use to complete the cleanup. The current schedule calls for treatment of the soil to begin later this year, and it is expected to take about six months.

District tackles landfill at Bonneville Lock & Dam

By Gay Monteverde
Portland District

In the 1950s, when Johnny said he was sick, Mother went to the medicine cabinet for the thermometer. She shook the silvery strip down below 98.6 degrees, put the thin tube under Johnny's tongue, waited several minutes, then checked to see if he was running a fever.

Those old thermometers were glass. If dropped they shattered, sending glass and tiny spheres of silver liquid scurrying. Mother swept up the glass slivers and dumped them in the wastebasket. Maybe she got the silver liquid, maybe it scattered throughout the house to gleam forgotten in the cracks and corners and deep in the carpet.

Today, Johnny still has his temperature taken, but thermometers are now digital. Not only are the new devices quicker and more accurate, they are safer. That magical silvery strip was liquid mercury, a hazardous substance. And few parents, even modern ones, are trained to safely dispose of hazardous waste.

Landfill. When Bonneville Lock and Dam began producing power on the Columbia River in 1938, the phrase "hazardous, toxic, radioactive waste" (HTRW) was unknown. Like Johnny's mother, there were things we didn't yet understand. For example, between 1942 and 1982, the landfill on Bradford Island at Bonneville was used to dispose of household garbage and some project waste. Oil and grease, paint and solvents, scrap metal, mercury vapor lamps, pesticide residues, sandblast grit, switchgear, and cables found their way to the half-acre plot.

In the 1970s, new environmental laws were enacted and knowledge of potential environmental damage from common materials grew. The U.S. Army Corps of Engineers began to look in its own "medicine cabinets" to see what kind of "thermometers" it was using. The problem, of course, is that by the time environmentalism became a national byword, much damage had already been done by business, industry, government, and households.

ERGO. Portland District began work to bring Bonneville, and its other projects throughout Oregon, into compliance with national environmental protection standards using a comprehensive self-evaluation and program management system called ERGO (Environmental Review Guide for Operations). With ERGO, a team of Corps personnel or a contractor assesses potential hazardous problems at each district project every five years. The evaluation assesses 14 different areas: air emissions, cultural and historic resources, hazardous materials, hazardous waste, natural resources, pesticides, petroleum/oil/lubricants, solid waste, special pollutants, underground storage tanks, wastewater, water quality, and floating plants.

Each item is scored as a significant problem, a major problem, or a minor problem, and corrective action is identified. Sometimes a problem is administrative ("put lids on the cans when you're not using them") and can be handled immediately; occasionally the problem requires extensive further investigation.

Bonneville's first ERGO audit was in 1992. At that time, the Bradford Island landfill was a minor finding because the ERGO team did not have information about contaminated items. Between 1992-95, all 31 items identified for corrective action in the 1992 audit were completed, but as years passed and information trickled in, concern grew about the landfill.

Money is one reason progress is slow. It is expensive to clean up hazardous waste. The federal government has a

two-year budget cycle; funding for projects under way today was requested at least two years ago. And you have to clearly identify the problem before you ask for the money.

Even once the problem is identified, a solution is not always obvious. A number of agencies are often involved in deciding what to do about a particular site, and sometimes they have different priorities or even different beliefs about the right solution.

PCBs. One example illustrates the complexities of cleaning up hazardous waste sites — recent discoveries of electrical components in the Columbia River off Bradford Island. A few components and the sediment underneath them contain PCBs (polychlorinated biphenyls, classified by the Environmental Protection Agency as "probable human carcinogens").

The area is on a Corps project, and the adjacent river is home and a migratory pathway for endangered species, so more agencies are involved. The players include the U.S. Fish and Wildlife (USFWS), the National Marine Fisheries Service (NMFS), the Oregon Department of Environmental Quality (DEQ), and the Corps.

According to Mark Dasso, program manager for the Bradford Island site, "The plan which the Corps and DEQ devised to remove the components from the river has caused concern for NMFS and USFWS, who are worried that sediments would be flushed downriver. Right now, I'm not sure how we're going to work that out."

The Corps is developing priorities and schedules for work on the landfill and in the river, in consultation with a private contractor, and is also working with DEQ to identify other areas on Bradford Island that may be incorporated into the study. A final evaluation report is expected in 2002. Progress on the landfill is slow, but there is progress.

Public affairs. In the meantime, a lot of inaccurate or incomplete information is circulating about Bradford Island, highlighting a second major challenge in HTRW work — explaining to the public that the Corps is doing the right thing. Dasso meets monthly with the district's senior leaders, and the public affairs office sends out news releases when there is news to report, and responds to media inquiries regularly.

But that wasn't enough! So the public affairs staff created a Web site to give information about Bradford Island to anyone. The site can be viewed at <http://www.nwp.usace.army.mil/issues/welcome.htm>.

District Commander Col. Randall Butler posted the following message on the site:

"Since 1998, when the Corps signed a Voluntary Cleanup Agreement with the Oregon Department of Environmental Quality (DEQ), we have worked closely with DEQ experts to investigate the Bradford Island Historic Landfill at Bonneville Dam, and the river near the landfill.

"We hired outside experts in hazardous waste investigation to do the necessary studies: to fully identify the landfill contents; the extent of soil contamination from those materials; whether or not ground water or surface water is contaminated; and whether or not there is seepage from the landfill into the river.

"The contract was expanded to work with materials found in the river. We need to know how big the problem is as we work to solve it. And then we need to do the right things — whether it's cleanup or remediation.

"We are committed to appropriately cleaning up or remediating the Bradford Island Landfill and the adjacent in-river areas. We are working hand-in-hand with DEQ, NMFS, and USFWS so that our actions from this point forward are those that will best protect the environment."

(Gay Monteverde is a freelance writer in Portland, Ore.)



Perchlorate

Tulsa District leads in cleaning up new HTRW category

By Jonna Polk
Tulsa District

As contaminant lists are revised and technology and techniques advance, the environmental cleanup arena constantly changes. Tulsa District and the Army Operations Support Command are leading the Department of Defense in one new cleanup category. Perchlorate, the regulatory community's most recently identified contaminant of concern, is being successfully tackled at Longhorn Army Ammunition Plant (LHAAP) in Texas. The plant is the first DoD facility to install perchlorate removal treatment.

"The Army has aggressively addressed the perchlorate issue at Longhorn," said David Tolbert, commander's representative for Louisiana and Longhorn ammunition plants.

History

The Longhorn plant was listed on the Environmental Protection Agency's (EPA) National Priorities List in 1990, and has been inactive since 1997. Last fall, the Army signed a memorandum of agreement with U.S. Fish and Wildlife Service to transfer the majority of the plant's 8,493 acres to establish a wildlife refuge.

Ammonium perchlorate was used at the plant as the primary ingredient in solid propellant for rockets and missiles. The area surrounding the Perchlorate Grinding Building in the production area of the plant was originally investigated.

The presence of perchlorate there led to concerns that groundwater being extracted from another site, the Burning Ground, might also contain perchlorate, since wastes from the production area were historically disposed at the Burning Ground.

Shallow groundwater extracted from the Burning Ground and treated at the groundwater treatment plant is discharged into surface water about one mile upstream of the plant boundary at the edge of Caddo Lake. The lake is a source for drinking water for several communities in Texas and Louisiana.

Early treatments

The groundwater treatment plant, which began treating water in 1997, was not designed to treat perchlorate. The contaminant is of concern because of potential health effects at low concentrations and the effects it may have on ecosystems.

It was identified as a contaminant at Longhorn in 1998, when tests confirmed that the groundwater being extracted and treated to remove metals and volatile organics contained perchlorate at an average concentration of about 14,000 parts per billion (ppb).

Surface water samples collected at the plant boundary have contained detectable quantities of perchlorate.

In December 1999, the Texas Natural Resource Conservation Commission (TNRCC) invoked dispute resolution under the Federal Facilities Agreement to require the Army to address the perchlorate discharge from the treatment plant.

From that process, a three-year regulatory schedule was developed for the Army to identify and implement a technology to treat perchlorate.



The biological fluidized bed reactor is an important part of breaking down perchlorate contamination. (Photo courtesy of Tulsa District)

Solution

Operations Support Command and Tulsa District identified a technology for bioremediation of perchlorate, and were able to execute it nearly two years ahead of the regulatory schedule.

"The construction portion of the project has gone from civil design and civil engineering to finished construction in five months," said Bill Corrigan, groundwater treatment plant manager.

This February, a biological fluidized bed reactor (FBR), designed by Envirogen, Inc., was installed at LHAAP. At a cost of about \$650,000, the FBR was much less expensive than alternative treatment technologies considered. The FBR contains microbes that convert the perchlorate ion to oxygen and chloride. Acetic acid is added to the FBR as a nutrient for the microbes. The FBR is added to the treatment train following metals precipitation and air stripping.

The technology is already removing perchlorate from extracted groundwater. "It's definitely working," said

Corrigan. On Feb. 16, the FBR began treating water with an average concentration of 14,000 parts per billion. By March 7, the concentration was below the detection limit of 4 ppb. The TNRCC requires that the effluent discharge not exceed a daily average concentration of 375 ppb.

The communities near the ammunition plant, EPA, and TNRCC and are all pleased with the proactive approach the Army has taken to address the perchlorate discharge from LHAAP.

"We have appreciated the efforts of Tulsa District to be responsive to the regulatory community and the public's concerns," Tolbert said. Perchlorate concentrations are being reduced significantly below required levels; the project was completed ahead of schedule at a reasonable cost; and it will have low annual operation and maintenance costs.

The project's success has already been noted. Texas has invited Army to present perchlorate investigation and treatment information to its technical staff this month.



Cleaning up the Environment

Hazardous, toxic, and radiological waste removal

Chicago District helps rebuild miles of shoreline on Lake Michigan

By Joanne Milo
and Vanessa Villarreal
Chicago District

The Chicago shoreline project involves rebuilding 9.2 miles of shoreline. It provides storm damage protection to the Lake Michigan shoreline and, in particular, to Lake Shore Drive, a federal highway and major transportation corridor in Chicago.

The existing shoreline structures, built in the early 1900s, have deteriorated and no longer protect against storms, flooding, and erosion. For planning and construction purposes, these 22 miles of shoreline have been broken into six sections, called *reaches*. Construction features include:

- **Reach 2** — Steel sheet pile and concrete stair-step revetment from Wilson Avenue to Fullerton Avenue.
- **Reach 2F** — Beach nourishment with attached breakwater at Fullerton Avenue.
- **Reach 3** — Steel sheet pile and concrete stair-step revetment at Solidarity Drive.
- **Reach 3M** — Rubble mound revetment at Meigs Field.
- **Reach 4** — Steel sheet pile and concrete stair-step revetment from about 23rd to 57th streets, with beach stabilization at 31st and 39th streets.
- **Reach 5** — Rebuild the breakwater at the South Water Purification Plant.

Local sponsors are Chicago and the Chicago Park District. This \$301 million project is scheduled for completion in 2005.

Completed projects

The Belmont Harbor Peninsula project rebuilt 1,000 linear feet of shoreline. Improvements included building stair-step revetment. This project cost \$5 million. The city and the park district awarded contracts for this project, which was completed in December 1999.

The Solidarity Drive project rebuilt 2,800 linear feet of shoreline. Improvements included building stair-step revetment. This project cost \$12 million. The city and park district awarded contracts for this project, which was completed in 1998.

The 31st Street Beach project rebuilt 800 linear feet of shoreline. Improvements included beach enhancement and building stair-step revetment, a submerged breakwater, a new pier, and an extension of the existing pier. This project cost \$6 million. The city and park district awarded contracts on this project which was completed just before Memorial Day.

The 31st to 33rd Street project rebuilt 1,400 linear feet of shoreline. Improvements included building stair-step revetment. This project cost \$6 million. The Corps awarded contracts for this project, and it was completed just before last Memorial Day.

The Reach 5, South Water Purification Plant Breakwater project rebuilt 800 linear feet of on-shore revetment and 2,600 linear feet of breakwater. This project cost \$12.5 million. The city and park district awarded contracts on this project, which was completed in 1998.

In construction

The Montrose (North) project is rebuilding 3,760 linear feet of shoreline. Improvements include building stair-step revetment. The estimated project cost is \$22 million. The Corps awarded the project contract last October 2000, which is scheduled to be completed in fall of 2002.

The Irving Park Road to Belmont Avenue project is rebuilding 4,450 linear feet of shoreline. Improvements include building stair-step revetment. The estimated project cost is \$23 million. The Corps awarded contracts on this project, which is scheduled for completion this summer.



A worker guides sheet piles in Lake Michigan at the 33rd to 37th Street project area. They are working about 20 feet from land. (Photo courtesy of Chicago District)

The I-55 to 30th Street project is rebuilding and rehabilitating 3,400 linear feet of shoreline. Improvements include building stair-step revetment. Estimated project cost is \$15 million. The Corps awarded contracts on this project, which is scheduled for completion this spring.

The 33rd to 37th Street project is rebuilding 2,050 linear feet of shoreline. Improvements include building stair-step revetment. The estimated project cost is \$11 million. The Corps awarded contracts on this project, which is scheduled for completion this summer.

The 51st to 54th Street project is rebuilding 1,600 linear feet of shoreline. Improvements include building stair-step revetment, and land expansion up to 100 feet from the existing shoreline. The estimated project cost is \$11 million. The city and park district awarded contracts on this project, which is scheduled for completion this spring.

In design

The Belmont to Diversey project will rebuild 3,200 linear feet of shoreline. Improvements will include building stair-step revetment. The estimated project cost is \$19 million. The Corps will award the contracts. Construction is expected to begin once environmental issues related to the former gun club area are resolved, possibly as early as this summer.

The Diversey to Fullerton project will rebuild 2,200 linear feet of shoreline. Improvements will include building stair-step revetment. A physical model study is being conducted by Waterways Experiment Station that could result in proposing additional features and/or configurations. The estimated project cost is \$15 million. The Corps will award the contracts. Construction is expected to be awarded this fall, with a spring 2002 construction start.

The Meigs Field project will rebuild 1,200 linear feet of shoreline. Improvements will include building rubble mound revetment. The estimated project cost is \$6 million. The city and park district will award the contracts.

Construction is expected to begin this summer.

The 37th to 43rd Street project will rebuild 6,050 linear feet of shoreline. Improvements will include building stair-step revetment, land expansion, and a new beach. The estimated cost of this project is \$36 to \$59 million, and work will be performed in two phases with two separate construction contracts. The Corps will award the contracts. Construction is expected to begin this summer.

The 54th to 57th Street project will rebuild 4,200 linear feet of shoreline. Improvements will include building stair-step revetment and a land expansion to accommodate a proposed new pedestrian underpass, part of the South Lake Shore Drive reconstruction. Estimated project cost is \$22 million. The city and park district will award contracts on this project. Construction is expected to begin this spring.

Not yet in design

The Montrose (South) to Irving Park Road project will rebuild 1,600 to 2,700 linear feet of shoreline. Improvements will include building stair-step revetment. The estimated project cost is \$12 million to \$17 million. The Corps will award the contracts. Construction is scheduled to begin in 2002.

The Fullerton/Theatre on the Lake project will rebuild 1,200 linear feet of shoreline. Improvements will include building stair-step revetment, beach nourishment and/or park expansion, and possible breakwater/jetty features. The estimated project cost is \$8 million. The city and park district will award the contracts. Construction is scheduled to begin in 2002.

The 43rd to 51st Street project will rebuild 6,500 linear feet of shoreline. Improvements will include building stair-step revetment. The estimated project cost is \$42 million. The city and park district will award the contracts. Construction is scheduled to begin in 2003.

(Joanne Milo is the Chicago shoreline project manager. Vanessa Villarreal is the editor of "Chicago Breeze.")

'You'll never go hungry' on *Essayons*

By Heidi Helwig
Portland District

Rick Powers begins his day like many other people, with a fresh cup of coffee and breakfast. That's where the similarities end. Rising at 3:45 a.m. each day aboard the dredge *Essayons*, he begins the routine of preparing the galley and himself to feed 21 people a full complement of breakfast foods, including eggs made to order. If you trust Power's judgement, though, you'll try his scrambled eggs with tarragon or his concoction of eggs mixed with cottage cheese, spinach, and cheddar cheese.

By 5 a.m. breakfast is ready. By 6 a.m., Powers has posted the next day's menu.

Following breakfast, Powers turns the galley into a snack bar, offering anything from M&M's to cookies to peanut butter and jelly sandwiches.

"There's always food," Powers said. "That's one thing you never have to worry about. You never go hungry."

Powers then transforms the kitchen again into a lunchroom, preparing two full entrees and fruit and salad bars. The self-serve refrigerators are stocked with milk, juice, condiments, and pop. A cooler is full of ice cream bars. And, for those watching their weight, Powers also offers low-fat meals.

"I prepare the kind of meals you wouldn't make for yourself at home." That is, of course, unless you are one of the fortunate ones to learn trade secrets at the Johnson and Wales Cooking School in Rhode Island, or to learn the art of Bali Indonesian cooking in Bali, as Powers has.

At the cooking school, Powers said he learned about nutritional cuisine and seafood cooking, as well as basic cooking skills. "It gave me an appreciation of what a chef is," he said. "I'll never be a chef." While the cooking school was part of his official training, the Bali trip was purely personal with professional benefits.

"Meals have always been important, but now even more important for morale," Powers said. "If you have really crappy meals, morale gets really low. Things have changed here. You used to could tell what day it was by what meal we had. That's why I try new things. I don't want people to know what day it is."

Keeping a variety of meals is not always easy, Powers said. "To be good at it, you have to have a commitment that you won't slack off. You have to keep trying new things."

Fortunately, Powers said the crew he feeds also is willing to try new things. "I'll give 'em credit; these guys are always willing to try anything," he said. "Sometimes you have to sell it by saying, 'Try this. You'll regret it if you don't.'"

Not everything Powers tries is a success, however, like the ginger and clove soup.

"One guy tried it and he was kind enough not to throw it at me," Powers said. "It reminded me of an herbal cough medicine."

After lunch, Powers turns the galley over to fellow cook Paul Colebank who prepares the evening meal. Colebank is taking on-the-job training. "He does a great job; the crew really likes his cooking,"



Rick Powers (left) and Paul Colebank keep the crew of the *Essayons* fueled. (Photo courtesy of Portland District)

Powers said.

For crewmembers who cannot make the evening meal, a night lunch is left in the galley.

While Colebank works, Powers doesn't relax in his cabin. Instead, he heads for his office to catch up on paperwork, do inventory, and order the next month's groceries.

While Powers modestly calls the advanced ordering a "real guessing game," he has consistently kept his budget at about \$2,500 a week. An exception was when the *Essayons* sailed to New Orleans for some emergency work. Not knowing

when additional supplies could be ordered for the month's tour, Powers spent \$15,000 on groceries. "It was too much," he admitted, but preferred that to not having enough for his crew.

Cooking is not the only service Powers and Colebank provide. Powers also is responsible for having the linens washed and for hiring a janitorial house cleaner.

"I'm the gray-haired mother," Powers said. "We take care of people. When people need something, they come here. It's not always food."

And, perhaps most important, the two serve as the ship's rumor control.

"We're the last to know so we start making things up," Powers said in jest. But the reality is "that everyone comes through here to eat. So, if anyone wants to know something, they come here."

Powers is not a dyed-in-the-wool cook. While he was in the Army, he worked for the American Forces Network as a disc jockey. After the service, his brother Doug Powers, a chief engineer on the *Essayons*, interested him in a job as a waiter on the dredge *Biddle* and an alternate bed shaker. He was one of 14 galley crewmembers who served the dredge's crew of 50. He also worked a short while on the dredge *Harding* in the engine room.

In 1977, the *Biddle* was hit by a freighter and put out of commission. Until repairs could be made, *Biddle* crewmembers were transferred to the *Harding*, bumping other crewmembers, including Powers.

After getting caught by a Reduction In Force, Powers left the Corps and went to Reno, Nev., and Susanville, Calif., playing in bands with some Army comrades he met in Berlin.

"It's better to see more of the world," Powers said of his stint away from the Corps.

In 1986, a cook's position on the *Essayons* was advertised and Powers accepted it. At that time, there were four cooks working in the galley. Now, with just Powers and Colebank serving the crew, the hours are much longer. By the end of the day, Powers said he is beat.

"This is a great job," he said, adding he enjoys cooking, working with Capt. Neal Nyberg and traveling the area.

The worst part, though, he said, is its long hours. Even for him, 3:45 a.m. comes awfully early.

WWII veteran, 77, still going strong

Article and Photo
By Cindy Fergus
San Francisco District

At the age of 77, most people are retired and taking it easy.

Not Jack Aaron, a survey technician in San Francisco District's Hydrographic Survey Section. He's still going strong, and has no plans to do otherwise.

Aaron has 54 years of service in state and local government. He started work in 1942 as a laborer at Benicia Arsenal in California, and served in World War II as an engineer soldier in the Pacific theater. For several years he worked as a surveyor on California's roads and highways, and joined San Francisco District as a survey technician in 1964.

For the past 36 years he has done both land and hydrographic survey, and seen many interesting and innovative projects. In 1972, the first Humboldt Bay deepening project used helicopters for surveying, and the decade-long Santa Cruz beach nourishment study used military landing

craft to get soundings at all water depths right up to the land.

"He's like the sunrise and sunset," said Scott Carruthers, lead survey technician. "He's the most dependable person in the world."

Aaron trained Carruthers 17 years ago. In fact, Aaron has trained *everyone* in the district's Survey Section. Aaron's experience with the bays and channels in California has given his fellow workers unsurpassed knowledge.

Aaron loves San Francisco Bay. He feels he has either seen or been part of everything done in the bay for the last 35 years.

"He's a man of a million stories about the bay," said Sid Carlson, survey technician. "He's a first-hand history lesson."

And Aaron has no plans to retire. "My retirement plan is to *not* retire," Aaron said. "I'll never leave the bay. But if I ever do, I'll take the bus to Sausalito every day just like I do now to make sure these guys are doing their job."



Jack Aaron, 77, has been a government employee for 54 years, 35 as a survey technician with San Francisco District.

Around the Corps

General officer news

Brig. Gen. Steven Hawkins became the Director of Military Programs on Sept. 25. Previously, Hawkins served as the Deputy Chief of Staff, Engineer of U.S. Army Europe and Seventh Army.

SES reassignments

Rob Vining has transferred from Director of Programs Management Division in Little Rock District to Chief of Programs Division in the Directorate of Civil Works, effective in February.

Fred Caver transferred from Chief of Programs Division in the Directorate of Civil Works in Headquarters to Deputy Director of Civil Works, effective in January.

Steve Browning transferred from Chief of Programs Division in the Directorate of Military Programs in Headquarters to the Director of Engineering and Technical Services in South Pacific Division, effective in February.

Joe Tyler will transfer from Director of Programs Management Division in North Atlantic Division to Chief of Programs Division in the Directorate of Military Programs in Headquarters, effective in late March or early April.

Dave Sanford transferred from Chief of Policy Division in the Directorate of Civil Works in Headquarters to Chief of Interagency and International Services Division in the Directorate of Military Programs, effective on March 11.

"Selling" engineering

Mississippi Valley Division hosted its Fourth Annual "Salute to Engineers" during Engineer Week. Statewide video teleconferences (VTCs) were used to encourage Mississippi students to consider engineering as a career choice. MVD used Mississippi Educational Television's Star Schools Interactive Video Network (IVN). The network has more than 140 IVN sites statewide with a system in virtually every county.

Engineer panelists are recruited from local, state, and federal levels. Four to six engineers are chosen to participate each day, and the engineers "sell" engineering careers during the hour-long VTCs.

"We present a wide variety of engineering disciplines that pique students' interest," said Steve Gambrell, Executive Assistant at MVD. "They are beginning to consider careers, and this is the perfect opportunity to highlight Corps contributions to the nation."

"It's an eye-opening experience for our students," said Sherry Davis, a teacher at Tupelo Middle School. "Students just don't realize what engineers do day-to-day, nor do they realize how many different engineering degrees there are."

And students agree. "It was fun," said a student from East Columbia High School. "Being an engineer sounds like a good career and you make a lot of money."

Small business award

The winner of the Chief of Engineers Outstanding Support for Small Business Award is Col. Kenneth Kasprisin, Commander of St. Paul District. The award was given by Lt. Gen. Robert Flowers, Chief of Engineers, at Corps Headquarters on March 22.

Kasprisin's leadership in developing and implementing command-wide policies and programs led to significant improvements and increased goal achievements for the Corps' Small Business Program, and has placed St. Paul District in the forefront of support to the program.

Ecosystem conference

The first Corps-wide workshop combining all personnel engaged in environmental activities will be held April 17-19 in Portland, Ore. Presentations will be given by experts on a wide variety of environmental subjects.

Additional information and registration for the Environmental Remediation/Ecosystem Restoration Confer-

ence can be found at <http://ha.environmental.usace.army.mil/edw2001>. Or call Mike Klosterman at (703) 428-7337.

Good public relations

Kansas City District recently helped a local power company deal with low water on the Missouri River.

The Board of Public Utilities (BPU) in Kansas City, Kan., requested a Presidential Disaster Declaration because of the effect of low water levels on power distribution costs. The water levels were low due to reduced drought-cycle releases from dams. A high sediment sill in the intake at Nearman Power Plant also prevented cooling water from reaching the plant. Winter ice jams exacerbated the problem.

BPU had to purchase power on the spot-market. The cost was \$300,000 a day, 10 times the cost of generating power. Although the utility had a reserve fund to cover fluctuations in operating costs, it would rapidly be depleted and the costs passed to consumers, who faced tripled utility bills. Economic and summer water supply fears fueled congressional interests the entire length of the river.

BPU is a wholly owned municipal utility. Under Public Law 84-99, the Corps may assist when all available resources are exhausted. BPU requested an emergency meeting with Kansas City District's Steve Spaulding in Water Control, Public Affairs, the government of Wyandotte County, and city and state officials to seek solutions.

The day after asking for a presidential declaration, BPU wrote to the Northwest Division commander requesting higher releases from Gavins Point, the last downstream mainstem dam on the Missouri River. One million acre-feet of water were needed to tide the BPU over until spring. (An acre-foot is the water needed to flood one acre to a depth of one foot.)

That amount (a normal rate for a normal year), would tax the storage system during the current drought, especially during summer when water is essential for drinking and sanitation. Also, raising the river level risked creating even worse ice jams.

But BPU and Kansas City District came up with another solution. BPU developed a design modification to the Nearman Plant. They installed four pumps to pump water over the sedimentation sill and stop-logs, enabling the cooling pumps to operate.

The district approved the fix, but there was still one hurdle—a permit for construction that intruded into the channel. After review, the district decided to treat it as a modification to the original permit authorizing construction of the cooling water intake. Eight business days later, the district issued a decision permitting the modifications.

Correction

The island of Oahu is not the "Big Island" as reported in the March 2001 *Engineer Update*. That nickname belongs to the island of Hawaii, the largest and most southeasterly island of the chain.

Contingency Response Unit

The U.S. Army Reserve (USAR) has activated a Contingency Response Unit (CRU) to support Corps districts and divisions with overseas combat responsibilities. The CRU is commanded by Col. David Tebo, and located at the Lieber USAR Center in Alexandria, Va.

The CRU marks a new chapter in the USAR's support to the Corps. For many years, districts and divisions relied solely on Individual Mobilization Augmentees (IMAs) to support their mobilization, warfighting, and disaster relief missions. While the Corps will continue to rely on IMAs, "In peacetime, the CRU will support division commanders in operations planning. In operations they will be the core of the USACE commander's battle staff," said Maj. Gen. Milton Hunter, Deputy Commanding General.

CRU positions are available for all theater teams. The CRU is staffed primarily by engineer officers at the ranks

of major and lieutenant colonel, and NCOs at the rank of sergeant first class in military specialty 51H.

BRAC team

The Corps' Project Delivery Team Excellence Award recently went to the Reese Base Realignment and Closure (BRAC) Cleanup Team. The team includes members of Tulsa and Fort Worth districts, the Air Force Base Conversion Agency, Texas Natural Resource Conservation Commission, and the Environmental Protection Agency.

The team facilitated the DoD's fastest cleanup program for a base closure. This was no small task given the history of contamination at the base and the technical and schedule requirements that had to be met.

In addition, the team is on pace to Deed Transfer 100 percent of the base within five years of base closure.

Vacancy Notification System

The career referral system for CP-18 Engineers and Scientists (Resources and Construction), and CP-55 Real Estate, was disestablished in December 1999, which required careerists to apply for positions under merit promotion procedures. This meant searching for and applying for vacancy announcements.

To ease this transition, the Corps' Human Resources Office contracted for developing an automated notification (VACNOT) system. VACNOT is a voluntary registration system that enables individuals to register for up to five series in any location. Since the system was initially designed for CP-18 and CP-55, the first four fields are reserved for these career programs. The fifth field accommodates all other series, including the 340.

VACNOT is linked to the Department of Army vacancy announcement Web site (www.cpol.army.mil), so anytime there is an announcement for a position, an e-mail notification goes to the registrant.

The system was deployed in June and employees began to register. Unfortunately, automation problems caused delays while the contract employees obtained the security clearances to access the Department of Army announcement website. This caused the system to be off-line for several months, which was a good reminder that this service does not relieve applicants of their responsibility to apply for positions.

Employees who were previously registered may have to re-register. Registration instructions are at www.cp18and55.net. The Department of Army is considering implementing a similar system Army-wide.

The Vision!



**Coming soon
to a desktop near
YOU!**

'Farmer' herds very tiny 'livestock'

By James Gunnels
Nashville District

If you had told me a few years ago that I would someday be a "farmer," I'd have probably said, "You're crazy!" Well, I've been a farmer for several years now, and here's how it happened.

I understand that to be considered a "farmer" you must have at least five acres of land and "livestock." Well, I have seven-and-one-quarter acres of land, but I didn't know I had several thousand head of "livestock." Well, actually I *did* know about them, but I did *not* know that honeybees are considered "livestock."

Several years ago, a hive of honeybees moved into a hollow tree behind my garage. Last year that tree died, and last spring the wind blew the top off the tree. It broke off about three feet above the hole where the bees go in and out.

I remember my dad saying that bees almost always build up from where they enter. After seeing where the tree broke off, I knew that the top of the hive was exposed to the rain and weather, and I was concerned that they would swarm and leave for a more suitable location. I knew nothing about bees, but I wanted to keep them if I could.

So John Sharpe and Fred Corley came to see my bees. John is a retiree and an active beekeeper for an orchard. Fred is a close friend who I grew up with, and he just recently acquired some bees himself.

John said that the hive was too high to work with, so the only way to get the bees would be to cut down the tree. Since the tree was already dead, I took my chainsaw, notched the tree, and cut it down. When the tree fell, the top broke out, flipped over, and landed with the hole facing up. We were lucky; it broke about two feet below the hole where the bees go in and out, so the hive was completely contained in a five-foot section of the trunk. We could look into each end of the log and see bees and the honeycomb.

The bees seemed very gentle and didn't even get very upset when we cut down the tree. We left the hive lying on the ground from Saturday until Tuesday so John could get his bee vacuum.

On Tuesday afternoon, John and Randy Rowe, president of the Wilson County Beekeeper Society, came over and we began removing the bees from the log and placing them in a standard beehive body with frames.

We took John's bee smoker, smoked the bees to quiet them, and I started sucking them up with John's bee vacuum. Then John took the chainsaw and sliced the top of the log open, cutting a strip out of the log about four inches wide down the entire length, and just deep enough to allow us access to the bees and honeycomb.

We wanted to save as much of the honeycomb (and bees) as possible because it contained eggs and emerging bees (brood). If this were not done, the hive population would probably almost die out before new eggs could be laid and mature.

A bee lives only about three to six weeks in the summer, and it takes 21 days for the queen to lay eggs and for the eggs to mature and hatch. At best, it would have drastically affected the hive and reduced



John Sharpe (left), Randy Rowe (obscured), and James Gunnels transfer bees to a standard commercial beehive. (Photo courtesy of Nashville District)

the number of bees.

We cut the existing honeycomb loose from the side of the log, then into sections that would fit into the frames of a commercial beehive. We attached these sections to standard hive frames with rubber bands, then set them into the new hive body. The honeycomb lay in layers inside the log, and the layers ran the full

length of the log.

While John and Randy did this, I vacuumed bees. This process continued for two-and-a-half hours as we removed the entire hive and placed it into frames.

Once we finished, we sprayed the bees that I had vacuumed with sugar water so they could not fly until they dried off, then we poured them into the new hive body.

We never saw the queen so we weren't sure if we got her, or if she was injured in this process, but we felt she must be there. The next morning the bees had already started carrying debris out of the hive, and had begun gathering pollen and nectar and looked like any other beehive.

A week or so later, John and Fred came over and we opened up the hive to inspect it. We found new eggs and new brood, and the bees had been busy repairing the damage we did removing them from the log, and were filling in new honeycomb between the existing honeycomb and the new hive frames. Everything looked good. We still didn't see the queen, but she appears to be active and working.

These days, a couple of times each month I open the hive and inspect it. I want to make sure the queen is still laying eggs and there are no signs of disease. The hive looks good and seems to be thriving. The extremely dry weather we experienced last summer drastically reduced the amount of pollen and nectar for the bees to make honey, so I didn't harvest any honey last year. And of course I have to get them through this winter before I can see what next summer will bring. But I've learned a lot about bees and I'm having fun being a "farmer."

(James Gunnels is a civil engineer in Nashville District.)

District has bluegrass band

Article and Photo
By Bill Peoples
Nashville District

*"Rocky Top, you'll always be
Home sweet home to me!
Good ol' Rocky Top,
Rocky Top Tennessee!
Rocky Top Tennessee!"*

The lyrics rise above the steady rhythm of a bass guitar and the sweet combined melody of a mandolin, a five-string banjo, and six-string guitar as the "Deep Water Boys" of Nashville District entertain another enthusiastic crowd.

"We've been around for almost 30 years," said Ralph Ownby, Assistant Chief of Operations Division. "For years we were known as the 'Hatch Act,' for Lt. Gen. Hank Hatch, former Chief of Engineers and former Nashville District commander. The original group just got together because we all love to play, and we all loved bluegrass. Most of us had been playing since we were young, and had played with other bands."

"We've been fortunate to have some fantastic musicians play with us," said Ownby. "For years, Joe Patterson played the fiddle for us and Roger Deitrick played the bass. Wayne Lanier is a great banjo player and Todd Yann can play anything with strings on it, as well as the organ and piano. Todd plays the mandolin and guitar for us. Barney Davis plays the bass guitar for us. Todd and I are the singers of the group. At least, so far we haven't gotten Wayne, Barney, or Roger to sing."

For the "Deep Water Boys," playing music has been a lifelong activity. Ownby began playing and singing as a boy from



Barney Davis (left), Ralph Ownby, Wayne Lanier, and Todd Yann of the "Deep Water Boys" perform at a Nashville District reception.

the mountains of western North Carolina. Yann comes from a musical family and has a brother who is a professional musician. Davis began playing in bands in high school. Lanier picked up banjo playing while out west working for the U.S. Army Corps of Engineers, and has studied with professional banjo players.

The "Deep Water Boys" have played together for so long because of a genuine love of bluegrass music and the joy of playing it.

"Although we come from different musical backgrounds, we all love to play music and especially bluegrass music," said Yann. "Bluegrass is known for its driving rhythm played on the mandolin, intricate banjo solos, and the 'high lonesome'

sound of the vocals."

The band performs at district functions and for other organizations.

"We play at a lot of retirements or dinners when folks are leaving, and for the Engineer Day picnic every year," said Ownby. "We've played for other folks that we have connections with, like the Tennessee Recreation and Parks Association (TRPA) and the Society of American Military Engineers. In fact, probably the highlight of us playing together was playing on the stage of the old Ryman Auditorium (former home of the Grand Ole Opry) for a TRPA convention a few years ago."

"Our next goal is to play on stage at the Grand Ole Opry, but I don't know if we'll ever make that one," Ownby added.